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PHOTOGRAPHS OF THE NEBULA OF *ORION* WITH THE GREAT TELESCOPE.

On pages 57 *et seq.* of the present volume I have given a brief account of some negatives of the nebula of *Orion* made during the present opposition with the great telescope, with the special object of studying its performance on stars and nebulosity. Since that note was written Mr. SCHAEBERLE and myself have made a few exposures, and the following brief notes of a comparison of all our negatives may serve as a supplement to the conclusions previously given.

The plates employed were always Seed 26, and they have all been developed by Mr. BURNHAM. The magnitudes of the stars here given are expressed in BOND'S scale. BOND 17–18 magnitude = ARGELANDER 15 magnitude approximately.

Exposure 5^m: Star 649 (10.8 magnitude) is visible, 709 (12.3 mag.) not visible. All of the central nebulosity can be traced, but the outline of the southern apex of the Huyghenian region is very faint.

Exposure 10^m: In this negative the central portions all show well, and the brighter stars have not yet begun to destroy the effect of the nebulosity by their spreading on the plate. The faintest star visible is LASSELL'S *b*, between 685 and 708. This star was only seen twice or three times during seven years' visual observation with the 26-inch telescope at Washington. It was not seen by BOND. Its visual magnitude is probably about 15, but it shows in this negative, as well as 671 (11.5), 686 (15.6), 622 (12.7), 612 (13.5), 618 (13.1), 663 (11.7), 681 (14.8), 567 (13.9), 651 (13.1). The magnitudes in parentheses are BOND'S.

In *lacus Lassellii*, half-way between stars 641 and 651, a nebulous mass was seen at Washington, from 1878 to 1881. It was certainly not visible during the years 1874–78. This mass *(h)* is plainly visible in the negative exposed 10^m. Visual observations also show that it has materially increased in brightness since 1881.

Exposure $16\frac{1}{2}^m$: Essentially the same remarks apply to this negative as to that exposed 10^m. I might add that star 642 (15.6) has become visible, and that the detached nebulosity about star 734 just barely begins to show.

Exposure 19^m: Same remarks as for $16\frac{1}{2}^m$, except that all the details of the picture are a little clearer and more definite. The nebulosity about 734 is evident, but it extends only a few seconds from the star.

Exposure 40^{m}: For the examination of the brightest parts of the nebula this exposure is almost long enough. The nebulosity shows well, and the images of the brighter stars are not yet so large as to be very troublesome.

The sharp edge of nebulosity, which extends to star 793, does not show. The nebulosity about 734 does not extend more than 50″ from the star in any direction.

Exposure 60^{m}: On the whole, this exposure is about the best for this object with the great telescope.

Exposure 97^{m}: The bright central portions of the nebula have become too dense with this exposure, and the bright stars are too large, while there is little real gain in the extent of the fainter nebulosity.

Exposure 195^{m}: The same remarks as for 97^{m}. The nebulosity about 734 is now perfectly well shown.

The foregoing memoranda, which will be of little interest to those who are not familiar with the nebula, are yet of value in the comparison of the great telescope with other photographic instruments. They show that for stars and clusters it has material advantages, both in its aperture and in its long focus. For the brighter nebulæ it has advantages on account of the large scale of the picture. For the fainter nebulæ short-focused reflectors of large aperture are much to be preferred. The preceding data enable one to judge quantitatively of these points. E. S. H.

DUPLICATES IN THE LIBRARY OF THE LICK OBSERVATORY.

The following duplicate volumes, among others, are in the library of the Lick Observatory. All of them are neatly and substantially bound, some of them in morocco:

ARAGO: Astronomie Populaire, 4 vols., 8vo.

ARGELANDER: Abo Observations, vols. 1, 2, 3, folio.

BALL: Elements of Astronomy, 1 vol., 16mo.

BERLINER JAHRBUCH: for 1887, 1 vol., 8vo.

GOULD: Uranometria Argentina (the text only), 1 vol., 4to.

HERSCHEL: Cape of Good Hope Observations, 1 vol., 4to.

LAMONT: Catalogues of Stars, 6 vols., 8vo.